Just a Word

about

Grain Dust Explosions

U.S. Department of Agriculture
U.S. Grain Corporation

IF YOU OWN A MILL OR ELEVATOR OR IF YOU WORK IN ONE

THIS MESSAGE IS FOR YOU

Did you know that between March, 1916, and October, 1917—a period of 20 months—dust explosions destroyed four of the largest grain and cereal establishments in the United States and Canada, killing 24 people, injuring 36, and destroying foodstuffs and buildings to the tune of $6,000,000?

March, 1916—October, 1917
20 Months
4 Explosions

And that from October, 1917, to May, 1919—a period of 19 months—not a single disastrous dust explosion in a flour mill, cereal mill, or grain elevator occurred in this country, where the workmen had been asked by Uncle Sam to cooperate in preventing these explosions?

October, 1917—May, 1919
19 Months
No Explosions

But that from May, 1919, to September, 1919—a period of only 4 months—five very serious dust explosions in the United States and Canada caused the death of 70 people, injury to many more, and the loss of property valued at over $6,000,000?

May, 1919—September, 1919
4 Months
5 Explosions

Obviously the elevators and mills handled more grain and flour in the second period than in the first, had just as much trouble with the changing of help, and were forced to employ inexperienced men. In the natural course of human events, it would seem that the chances for explosions later were far greater than during the first period. Here is the secret:

Why This Difference?

From October, 1917, to May, 1919, all the men in the flour mills, cereal mills, and elevators were earnestly doing their bit toward winning the war by following implicitly the Government directions for the prevention of dust explosions, with their attendant loss of foodstuffs necessary for our army. As the war drew to a close, did the vigilance throughout the mills and elevators relax somewhat, as a result of which came the five disasters of the third period?

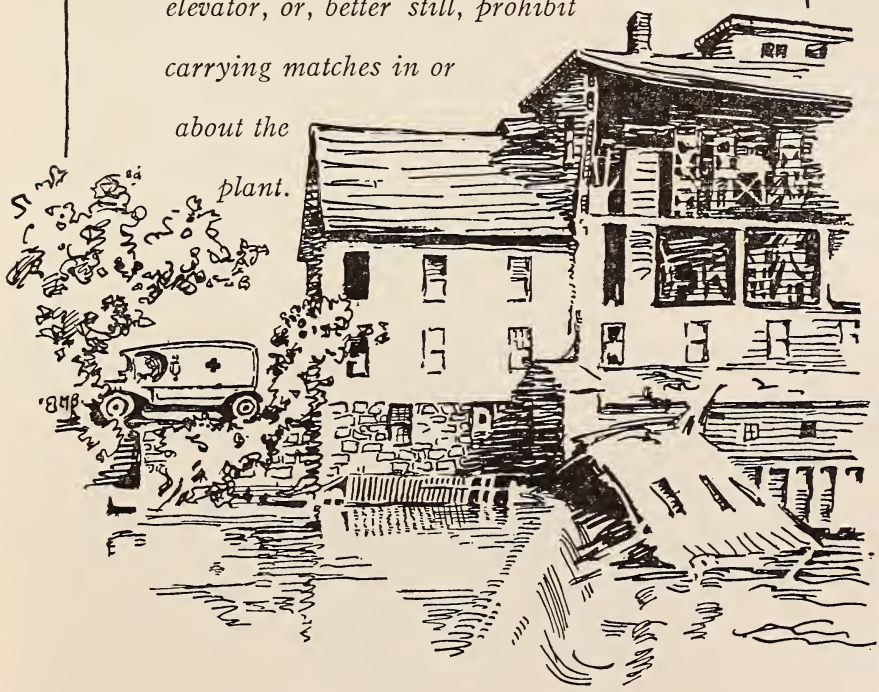
Your Duty

Whether you own the plant, operate it, or are the most poorly paid employee on the premises, the safety of your plant in a large measure lies in your own hands. Even if the loss of the plant and your job mean nothing to you, how about your life? Just a little extra care will save all three.

EXPLOSION CAUSED BY LIGHTING A MATCH.

It was nearly time to stop work and Mr. Flour-Packer thought he would see how much flour was left in the bin overhead. Upon looking into the bin he found it was so dark that he was unable to see just how much flour there was. He struck a match. The side of the flour mill was blown into the creek and Mr. Flour-Packer was carried to the hospital.

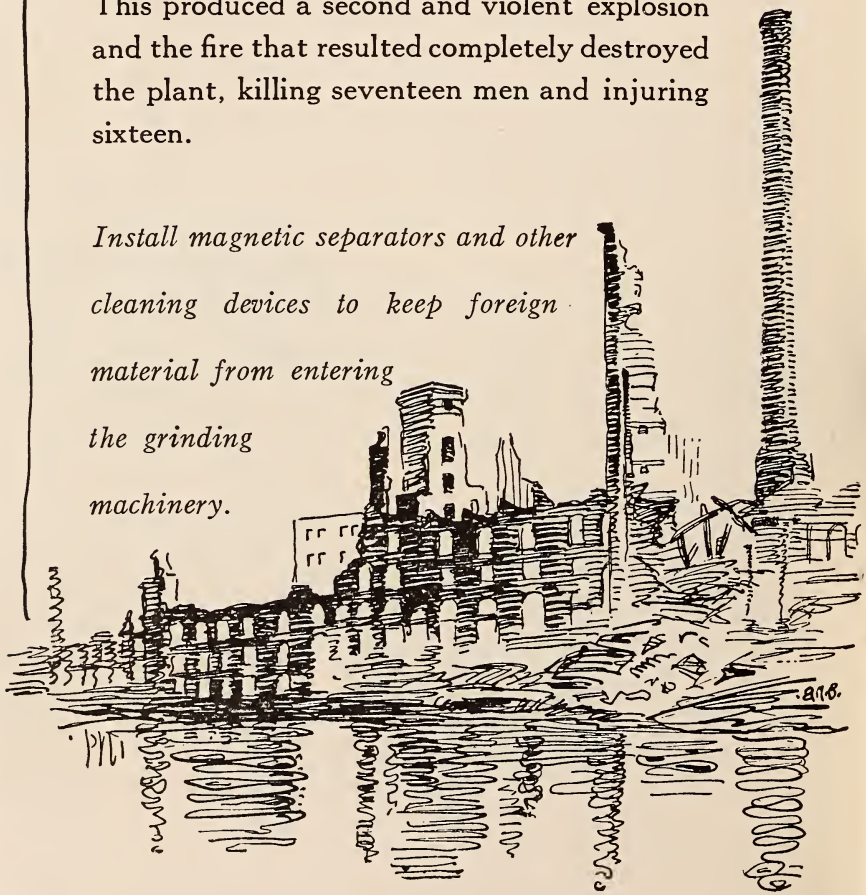
Never strike a match in a flour mill or elevator, or, better still, prohibit carrying matches in or about the plant.



FOREIGN MATERIAL ENTERING GRINDING MACHINE CAUSES DISASTROUS EXPLOSION AND FIRE.

A feed-grinding plant in Canada met with a $2,000,000 loss from an explosion and fire caused by foreign material entering the grinding machine. The sparks created by this foreign material passing through the grinding plates ignited the dust in and around the machine. A small explosion followed. Dust-laden air propagated the flame to a large bin, where the dust had been stirred into suspension. This produced a second and violent explosion and the fire that resulted completely destroyed the plant, killing seventeen men and injuring sixteen.

Install magnetic separators and other cleaning devices to keep foreign material from entering the grinding machinery.



FIRE IN ELEVATOR CAUSED BY STATIC ELECTRICITY.

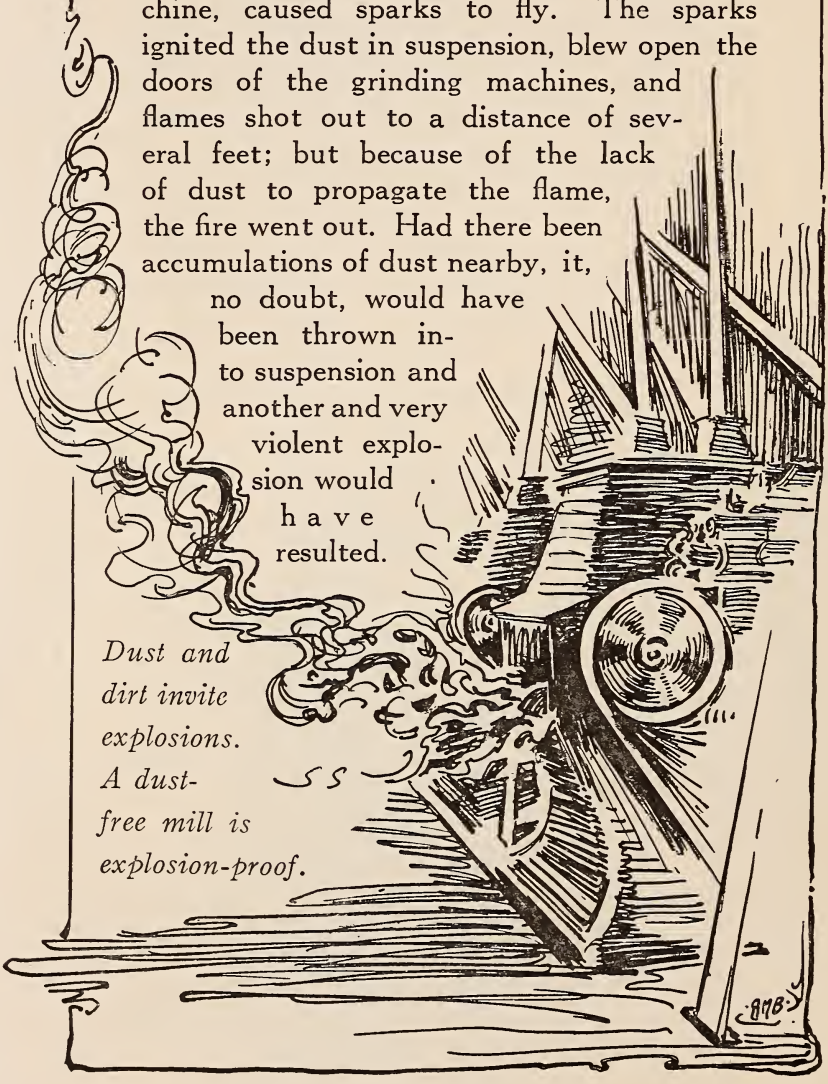
Friction between any two dissimilar bodies will produce static electricity. A spark of this type started a fire in an elevator head of a Southern export house. Since the elevator heads and legs were completely boxed in and the machinery was operating properly, there was absolutely no possibility of any cause for this fire except static electricity. The discharge ignited the dust in the elevator head, the flames burst out and caused a fire on the top floor. Fortunately, the plant was equipped with an automatic sprinkler system and the fire was extinguished before much damage was done. By grounding every elevator head in the building, this danger was eliminated, and since that time no fire or explosion has occurred in this plant.

Eliminate static electricity. Install an improved type of fire-fighting apparatus.

CLEAN PLANT ESCAPES DISASTROUS EXPLOSION.

It was the custom at a certain cereal grinding mill in the Middle West to keep the plant as free as possible from all dust. This practice, no doubt, saved the plant from a disastrous explosion and fire. Some bits of foreign material got past the magnetic separator and, upon entering the grinding machine, caused sparks to fly. The sparks ignited the dust in suspension, blew open the doors of the grinding machines, and flames shot out to a distance of several feet; but because of the lack of dust to propagate the flame, the fire went out. Had there been accumulations of dust nearby, it, no doubt, would have been thrown into suspension and another and very violent explosion would have resulted.

Dust and dirt invite explosions. A dust-free mill is explosion-proof.



FRICTION FIRE THE RESULT OF CARELESSNESS.

At an elevator in the East, three men were transferring grain from a storage bin to a shipping bin, when one of them smelled the odor of burning rubber.

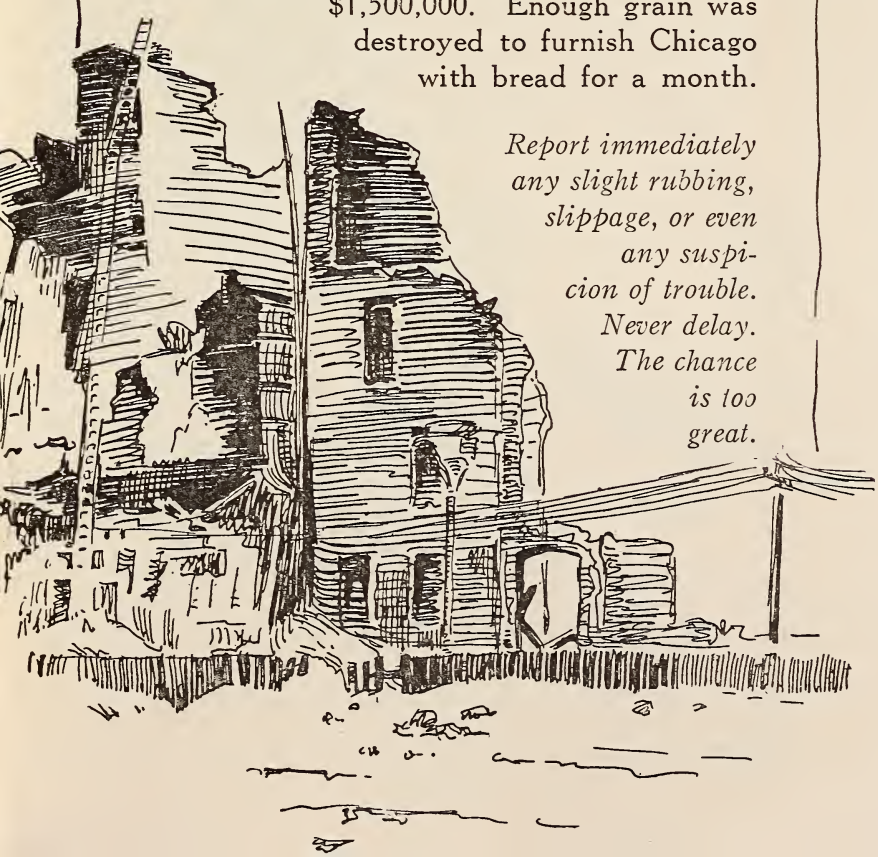
"I guess we had better see what is the trouble," said one.

"Let's finish running this bin first," said another. "We can finish in about ten minutes."

"All right," said the first, and they continued working.

A few minutes later—an explosion—and then a fire. Flames spread rapidly and the heat was so intense that the firemen could not get the fire under control. The plant was completely destroyed, with a loss of $1,500,000. Enough grain was destroyed to furnish Chicago with bread for a month.

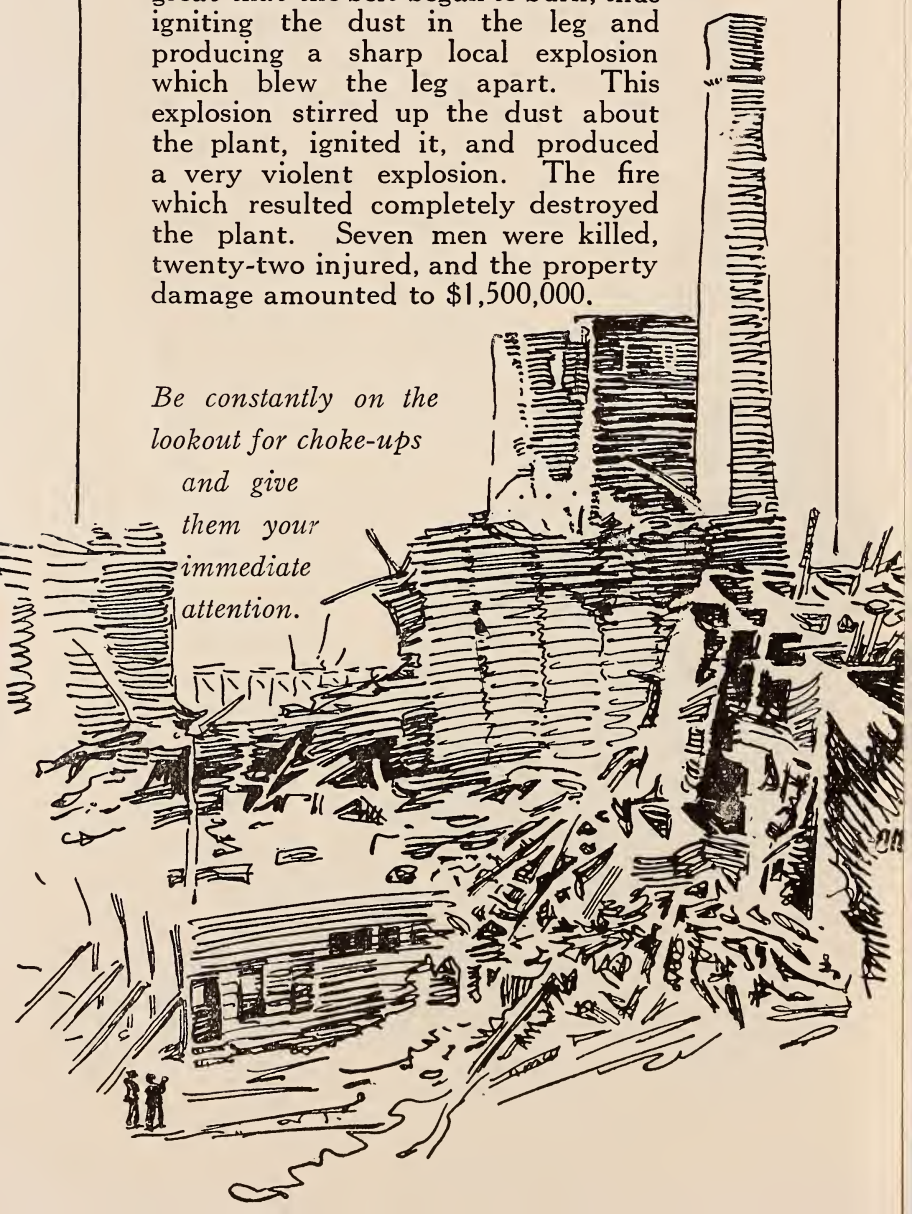
Report immediately any slight rubbing, slippage, or even any suspicion of trouble. Never delay. The chance is too great.



EXPLOSION AND FIRE CAUSED BY CHOKE-UP.

A choke-up occurred recently in an export elevator in the East. One of the men hurried to investigate and found it to be in leg No. 1. He signaled in for leg No. 1 to be shut down, but, because of some mistake, leg No. 2 was shut down instead. The belt in No. 1 continued to slip until the heat produced was so great that the belt began to burn, thus igniting the dust in the leg and producing a sharp local explosion which blew the leg apart. This explosion stirred up the dust about the plant, ignited it, and produced a very violent explosion. The fire which resulted completely destroyed the plant. Seven men were killed, twenty-two injured, and the property damage amounted to $1,500,000.

Be constantly on the lookout for choke-ups and give them your immediate attention.

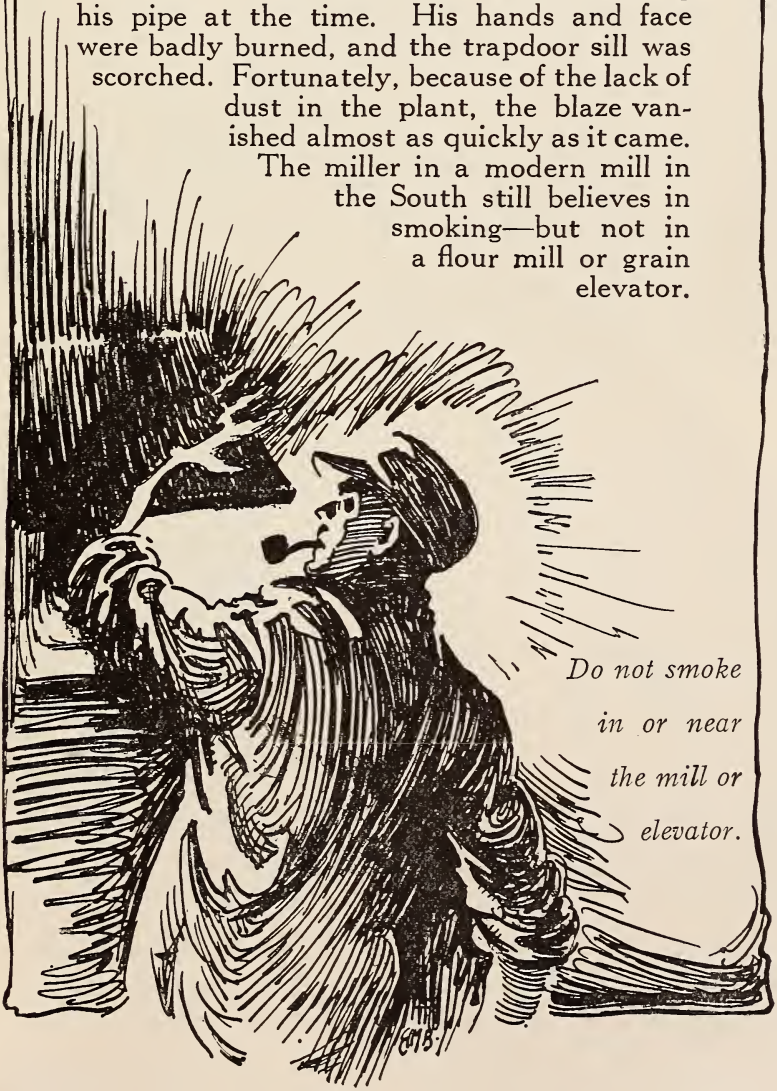


DO YOU BELIEVE IN SMOKING?

The miller in a modern mill in the South believed in having his plant clean, in having efficient fire-fighting apparatus, and in using a flashlight if he must inspect a bin by artificial light. Occasionally, however, he would go through the plant smoking his pipe.

One afternoon he wished to determine the amount of flour in a bin, so he took a flashlight, lifted the trapdoor of the bin, and was about to flash the light, when he found a mass of flames in front of him. He was smoking his pipe at the time. His hands and face were badly burned, and the trapdoor sill was scorched. Fortunately, because of the lack of dust in the plant, the blaze vanished almost as quickly as it came.

The miller in a modern mill in the South still believes in smoking—but not in a flour mill or grain elevator.

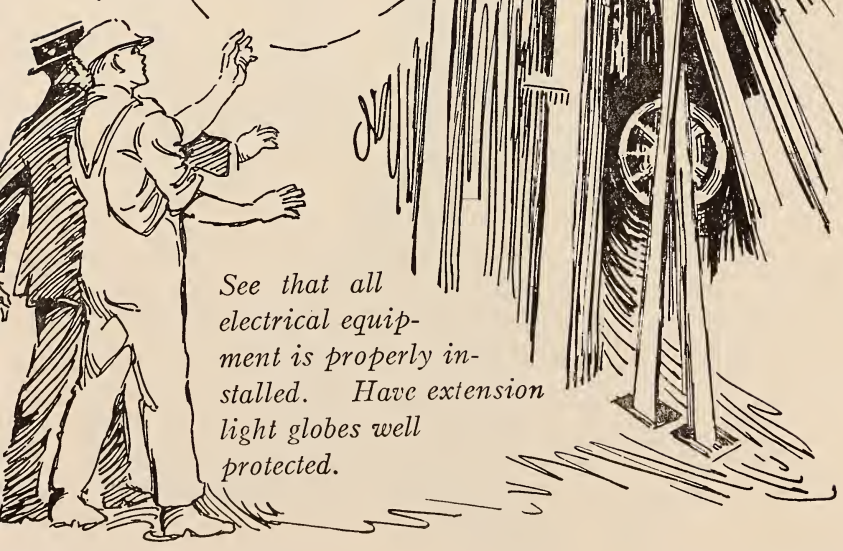


Do not smoke in or near the mill or elevator.

WHY ELECTRIC GLOBES SHOULD BE PROTECTED.

While inspecting an elevator in the East, an insurance man found an extension light with a flimsy wire guard lying on the floor, and remarked, "This light should not be lying on the floor."

"All right," said one of the men, and picked up the light, intending to throw it over a beam overhead. The bulb struck the beam and broke. This disturbed and ignited the dust which lay thick on the beam. Flames burst out for ten feet or more in every direction. Fortunately, there was little dust in the air, so a disastrous explosion did not follow.



See that all electrical equipment is properly installed. Have extension light globes well protected.

A DOZEN RULES FOR SAFETY.

CHECK THE ONES YOU FOLLOW.

☐ 1. Keep your plant clean. See that beams, spouting, machines, and floors are free from dust. A dust-free mill or elevator is explosion-proof

☐ 2. Inspect the plant frequently for hot bearings.

☐ 3. Keep constantly on the watch for elevator chokeups.

☐ 4. Report any slight rubbing, slipping, or other trouble with belts or machines.

☐ 5. Keep all foreign materials from entering the grinding machinery by installing a magnetic separator.

☐ 6. Do not smoke while in or near the mill or elevator.

☐ 7. Do not carry matches in or near the buildings.

☐ 8. Do not allow an open flame, lantern, or torch in the mill or elevator. Dust + open flame = explosion.

☐ 9. Do not lower artificial lights into bins to determine the amount of grain, flour, or feed they contain. A weighted tape or measured rope will give better results and eliminate the fire hazard.

☐ 10. Prevent the accumulation of static electricity on machines and belts by proper grounding methods.

☐ 11. See that all electrical equipment is properly installed, light bulbs well protected, switch and fuse boxes kept closed, and the use of old type carbon filament lamps in dusty atmospheres discontinued.

☐ 12. Sack the ground material immediately or convey it to bins of small capacity.